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Impact of Corporate Income Tax on Economic Growth in Zanzibar

Richard Zadocky Jacob and Rayyan Bakar Omar
Official Statistics Department, Eastern Africa Statistical Training Centre (EASTC), P.O Box35103, Dar es Salaam.
*Corresponding author: richard.jacob@eastc.ac.tz

Abstract

This study investigates the impact of corporate income tax on economic growth in Zanzibar from 1990 to 2021. The study employed the Vector-Error Correction Model (VECM) to examine the long-run and short-run impact of corporate income tax on economic growth. On the other hand, the Granger-Causality-Test was used to determine the causal relationship between the corporate income tax and economic growth in Zanzibar. The study used variables such as corporate income tax, value-added tax, excise duty, and economic growth from 1990 to 2021. The results revealed that, in the long run, corporate income tax had a significant positive effect on economic growth. However, there was no short-run impact of corporate income tax on economic growth in Zanzibar during that period. The Granger causality test was employed to determine a causal relationship between corporate income tax and economic growth, and the results indicated a unidirectional causal effect from economic growth value to corporate income tax. Furthermore, the study recommends that Governments should consider reducing tax rates since lower tax rates can encourage investment, promote entrepreneurship, and stimulate economic activity. In addition, the government should engage in a complete reorganization of the tax administrative machinery to reduce tolerable problems of tax evasion and avoidance.

Keywords; **Corporate Income Tax, Economic Growth,** Granger-Causality-Test, Vector-Error Correction Model (VECM)

1. Introduction

Taxation is the most important source of government revenue in nearly all countries in the world. Taxes are levied in almost every country in the world, primarily to raise revenue for government expenditures, although they serve other purposes as well (Ojede and Yamariki, 2012). According to the most recent estimates from the International Centre for Tax and Development, total tax revenues account for more than 80% of total government revenue in about half of the countries in the world and more than 50% in almost every country.

Taxes are classified as either direct or indirect, with the former type being the income tax and capital gains while the latter is the import duty, value-added tax, and excise duty. The income tax is imposed on individuals and corporations and the corporate income tax is imposed on net profits, computed as the excess of receipts over allowable costs (Musa *et al*, 2022). In 1980, corporate tax rates worldwide averaged 40.11 percent and 46.52 percent when weighted by GDP. Since then, countries have recognized the impact that high corporate tax rates have on business investment decisions. In 2022, the average is now 23.37 percent and 25.43 percent when weighted by GDP, for 180 separate tax jurisdictions (Enache, 2022).

One of the priorities for most sub-Saharan African countries is to raise more domestic revenue (Drummond *et al*., 2012). The revenue performance of sub-Saharan Africa as a region has improved over the past 30 years. However, there has been a steady decline in the unweighted average CIT rate in the region, from 44 percent in 1990 to 29 percent in 2017,

with some evidence of convergence over time. Moreover, in 2018 corporate taxes accounted on average for 19.2 percent of all tax revenues for African countries (Enache, 2020).

The African tax to GDP ratio increased by 1.4 percentage points from 15.1 percent to 16.5 percent between the years 2010 and 2018. This is due to revenue increases from value-added taxes (VAT, 1 percentage point) and individual income taxes (0.7 percentage points), while corporate income taxes decreased (by 0.5 percentage points). The average ratio has plateaued at 16.4/16.5 percent since 2014, as increases in some countries offset decreases in others (Enache, 2020).

Tanzania's overall performance in corporate income tax is 608.5 billion shillings equivalent to 81.2 percent of the target. The underperformance of corporate tax was due to a slight downward provisional amendment and filing of final returns, particularly by telecom companies (Ministry of Finance and Planning, 2022). On the other hand, Tanzania's mainland corporate tax has slightly decreased from 30.5% to 30% for five years from 2017/18 to 2021/22. Tanzania has attained economic growth of 6.2% in the year 2015, 6.9% in the year 2016, 6.8% in the year 2017, 7.0% in the year 2018, 7.0% in the year 2019, 4.8% in the year 2020 and 4.9% in the year 2021 (NBS, 2019). Zanzibar's economy continued to record strong performance, growing at an average of 6.3 percent in the period from 2011 to 2018. In 2018, real GDP grew by 7.1 percent compared with 7.7 percent in the preceding year. Official data for Zanzibar shows that economic activity is recovering. Real GDP grew by 5.1% in 2021, following a significant slowdown to 1.3% in 2020 due to the impact of the COVID-19 pandemic on the tourism-dominated services sector which accounts for nearly 50% of Zanzibar's GDP.

Recent research from the IMF and World Bank indicates that tax-to-GDP ratios lower than 15% are insufficient to finance even the most basic state functions. Yet Tanzania's tax-to-GDP ratio stood at a mere 11.6% in 2018, well below the sub-Saharan average of 16.5%. Thus, increasing tax-to-GDP ratios by 5% in the medium term (around five years) would be an ambitious, yet realistic way forward. The long-term average tax-to-GDP ratio from 2006/07 to 2017/18 was 12.2 percent (NBS, 2019). Zanzibar's corporate tax to GDP ratio rose from 11.8% to 12.7% between 2017/2018 and 2018/2019, also experienced a decrease from 2019/20 about 12.3% to 2020/21 about 10.8% and then a rise to 12.1% for the year 2021/2022 (Tanzania Revenue Authority, 2022). Theoretically, according to the benefit theory, the burden of taxes should be distributed among taxpayers according to the benefits they enjoy from government services or social goods. (Ahuja, 2016). The theory assumes that there is an exchange relationship between taxpayers and the government. The government should offer some benefits to taxpayers by providing social goods and services for which taxpayers pay consideration in the form of taxes for using such goods/services.

The macroeconomic effect of taxation on economic growth is commonly examined using the neoclassical growth model developed in 1950 by Solow and Swan. It's the starting point for almost all analyses of growth and for any attempt to understand analytically the underpinnings of the old and new theories of economic growth. This theory laid down how labour and capital contribute to the economic growth of a country (Barro *et al*., 1992). The Neoclassical Growth Theory postulates that short-term economic equilibrium is a result of varying amounts of labour and capital. On the other hand, the Solow neo-classical growth model suggests that taxes affect only the level of income but not the rate of economic growth (Solow, 1956). Changes in taxation will only cause temporary changes during the period of transition to steady states. Once a steady state is achieved, only technical progress will influence economic growth.

Considering the significance of corporate income tax revenue in the social-economic

development of countries in Sub-Saharan Africa, various scholars have conducted numerous studies. Kaewospa *et al*. (2022) studied the impact of Personal Income Tax (PIT) on economic growth in China and Thailand using the OLS method. The study revealed that in China, there is a significantly positive relationship between PIT and GDP over the study period. On the other hand, Thailand's PIT has a significantly negative relationship with economic growth. Corporate Income Taxes (CIT) in both China and Thailand have a negative impact on economic growth. Thailand's VAT has a negative relationship with GDP, whereas VAT in China does not have a significant impact on GDP. The study recommends that the fiscal revenue policy used to stimulate economic growth should consider lowering CIT rather than PIT and VAT.

Hafidh (2022) employed the VECM model to examine the impact of revenue collection on economic growth in Zanzibar. The findings indicated that total revenue and capital formation have a positive and significant effect on economic growth. This particular study concurs with the findings of Jackson (2020). In addition, Makame (2015) found that VAT had a positive and statistically significant impact on revenue generated by ZRB in Zanzibar. Kadenge (2021) used different indicators such as excise duty, customs duty, VAT and GDP to investigate the effect of taxation on economic performance in Kenya. The study reveals a negative relationship between income tax and economic performance. On the other hand, VAT, excise duty and customs duty had a positive relationship with GDP. Dladla and Khobai (2018) use the Auto-Regressive Distribution Lag (ARDL) approach to assess the impact of taxation on economic growth in South Africa. The empirical results confirm a negative relationship between taxes and economic growth. Forbin (2012) uses statutory corporate tax, total government expenditures and net exports from 1951 to 2010 to examine the effects of corporate tax on economic growth in Sweden. The results show that corporate income tax rates have no significant effect on Swedish economic growth.

The rationale for conducting this study focuses on the notion that in most developing economies, where alternative revenue streams may be limited coupled with low domestic revenue mobilization. Corporate income tax contributes to funding essential public services, infrastructure projects, and social programmes. Tax revenues from the corporate tax rate still remain a significant source of income for the government of Zanzibar. Furthermore, a stable and reliable source of government revenue, such as corporate income tax, helps in maintaining fiscal stability. This stability is crucial for economic planning, debt management, responding to economic shocks and recent aspirations and policies for the blue economy. Despite the increasing amount of corporate income tax, the sector still lagged behind others as far as other categories of tax revenue such as VAT, PAYE and excise duty. The best performer has been PAYE (income tax), whose ratio increased from 2.2% in 2000/01 to 5.0% in 2013/14 but declined gradually to 3.8% in 2020/21(Bank of Tanzania, 2022)
The theoretical and empirical literature indicates that there are several impacts of corporate tax on economic growth. On the other hand, reports by scholars on the impact of corporate tax on economic growth are contradicting (Forbin, 2012, Makame, 2015, Dladla and Khobai, 2018; Kadenge, 2021; Kaewospa *et al*., 2022), this might be due to difference in study areas and lack of consensus on the aggregation of the levels of categorical variables used in the analysis.

Previous empirical studies have been carried out to examine the significance of tax revenue for the economy of Zanzibar. However, most of these studies are concentrated on the very sector that attracted a large proportion of these tax revenues namely PAYE, and VAT (Makame, 2015; Salim, 2020; Hafidhi, 2022). Furthermore, there has also been less effort to examine the special relationship between corporate income tax and economic growth in the Zanzibar economy. Moreover, since the

impact of corporate tax on economic growth is still controversial among scholars, the question of whether the impacts identified by researchers in other countries are the same as in Zanzibar has to be addressed. Given the fact that the impact of corporate income tax on economic growth is not yet clearly stated, so the key question remains: "What is the impact of corporate income tax on economic growth?"

The particular findings of the study are expected to contribute by adding value to the stock of literature that will be crucial to both ZRA policymakers and tax management experts by aligning their corporate tax policies with international standards to attract foreign investment. This alignment helps create a favourable business environment and integrate into the global economy.

This study aims to examine the impact of corporate income tax on economic growth in Zanzibar with the following specific objectives: "*To examine the short-run and long-run relationship between corporate income tax and economic growth* and *to determine the causal relationship between corporate income tax and economic growth* from 1990 to 2021.

2. Materials and Methods

2.1. Data sources

The data used in this study ranged from 1990 to 2021. The data on corporate income tax and excise duty were obtained from the Tanzania Revenue Authority (TRA) and the data for economic growth proxied by GDP were sourced from World Development Indicators (WDI). On the other hand, the control variables, namely inflation rate and exchange rate were sourced from the Bank of Tanzania.

2.2. Methods

This study used a time-series analysis technique that involved various tests and estimations of the time-series model. The Augmented Dickey-Fuller (ADF) was adopted to test the stationarity of the series and all variables of the study. The Johansen cointegration test was used to examine the long-run equilibrium between the variables. Also, the Granger causality test was used to determine the causal relationship between corporate income tax and economic growth.

2.2.1. Variables and Model

2.2.1.1. Variable Measurement

The study examines the impact of corporate income tax on economic growth in Zanzibar. The dependent variable i.e., economic growth is measured by GDP which is defined as the final value of all finished goods and services produced within a country's borders during a specific period. It is calculated as the sum of private consumption, government expenditures, private capital investment and net exports at market prices in an open economy (Hanafi, 2016).

Meanwhile, the independent variable used in the study is Corporate Income Tax (CIT). It is a direct tax levied on the profits of a company. CIT is chargeable on all income of corporate entities (except for those that are specifically exempted by the Act). It's expressed as revenue from the tax on corporate income (national currency) on the Gross Domestic Product (GDP). CIT is widely considered progressive because it is, at least partly, borne by the company owner or shareholders, since they receive reduced dividends. Wealthy individuals, often men, usually represent the majority of shareholders (Begum and Pereira, 2011).). In Tanzania, corporate income tax is set at a rate of 30% of a company's total profit. Based on the theory, the expected sign of the estimated coefficient of CIT is positive. In the empirical literature, however, some studies find a positive relation between economic growth and CIT (Adegbie and Fakile, 2011; Babatunde and Adepeju, 2012) but there is another part of the literature that finds a negative relation. For instance, Olufemi *et al*. (2018) find a negative relationship between CIT and economic growth.

The study also employed control variables such as excise duty, inflation rate and exchange rate. Excise duty is a duty charged on specific goods and services manufactured locally or imported at varying rates administered by the country's customs services. It is charged at both specific and ad valorem rates (Ekeocha *et al*., 2012). Excise

duty is expressed as a ratio to GDP. Excise duties contribute to government revenue. The relationship between excise duty collections and overall economic growth is an important consideration. Higher excise duty collections may support government expenditure, potentially stimulating economic activity. It is assumed that excise duty has a positive impact on growth due to its effect on human capital. However, there are mixed results in the literature. Abomaye-Nimenibo (2018) and Olufemi *et al*. (2018) confirm a positive relationship between excise duty and economic growth. Meanwhile, Ebiringa and Yadirichukwu (2012), Muriithi (2013) and Onakoya and Afintinni (2016) found a negative relationship between economic growth and customs and excise duties.

Inflation rate. This variable indicates the annual increase in the level of prices of the goods and services that households buy. It is measured as the rate of change of those prices. The most well-known indicator of inflation is the Consumer Price Index (CPI), which measures the percentage change in the price of a basket of goods and services consumed by households. Inflation is accepted to capture the lack of monetary discipline within a country (Wisniewski and Lambe, 2015). Most of the literature generally finds a negative relationship between inflation and corporate income (Raji, 2015, Ali and Ibrahim, 2018, Meita and Nurdiniah, 2023).

The exchange rate is the price of one currency in terms of another. Official exchange rates and exchange rate arrangements are established by governments. There are many ways to measure an exchange rate. The most common way is to measure a bilateral exchange rate. A bilateral exchange rate refers to the value of one currency relative to another. Bilateral exchange rates are typically quoted against the US dollar (USD), as it is the most traded currency globally. The expected sign of the coefficient is ambiguous: Although a positive sign of this variable is generally expected, a negative coefficient is not implausible (Agbeyegbe *et al*., 2006; Kesriyeli *et al*., 2005).

Table 1: Description of Variable of the Study

Impact of Corporate Income Tax on Economic Growth in Zanzibar	Impact of Corporate Income Tax on Economic Growth in Zanzibar	Impact of Corporate Income Tax on Economic Growth in Zanzibar
Dependent variable	Economic growth (GDP)	Ratio
Independent variable	Corporate Income tax (CIT)	Ratio
	Excise duty	Ratio
Control variables	Inflation rate	Ratio
	Exchange rate	Ratio

2.2.2 Test and Estimation Methods

2.2.2.1. Model Estimation

In the estimation of parameters regarding the model to examine the impact of corporate income tax on economic growth from 1990 to 2021. The study included economic growth measured by GDP, corporate income tax, excise duty, value-added tax and the control variables inflation rate and exchange rate. This led to the formulation of a function of the effect of corporate income tax, excise duty and value-added tax on economic growth in the following form function:

$$GDP = f(CIT, EXC, IR, EXR) \quad \ldots\ldots (1)$$

Where:

GDP is economic growth value; CIT is corporate income tax; EXC is excise duty; IR is the inflation rate and EXR is the exchange rate

The study employed time series analysis of the multivariate regression model using the Vector Error Correction Model (VECM). The equation was linearized by applying natural logarithms of the variables in the model to bring normality among variables as used by Saqib *et al*. (2014). Njindan Iyke, and Takumah (2015, Juliana (2018), and Agunbiade and Idebi (2020).).

$$\text{LnGDP} = \beta_0 + \beta_1 \text{LnCIT} + \beta_2 \text{LnEXC} + + \beta_3 \text{LnIR} + \beta_4 \text{LnEXR} + \varepsilon_t \quad (2)$$

Where:

LnGDP is a logarithm of Gross Domestic Product

LnCIT is a logarithm of Corporate Income Tax

LnEXC is a logarithm of Excise Duty

LnIR is a logarithm of Inflation rate

LnEXR is a logarithm of Exchange rate

β_0 is the constant value

ε_t is the error term, and

β_1 to β_4, represents the coefficients of the variables.

2.2.2.2. Co-integration test

This method is used to check if there is a long-run equilibrium relationship between non-stationary variables. When two or more variables are non-stationary, it is typical to predict that their linear combination will likewise be non-stationary. However, if the linear combination is stationary, the variables will share the same stochastic trends, which cancel out when they are combined. Therefore, the regression of these variables will be meaningful and not spurious (Kremers *et al*, 1992). The relationship between the corporate income tax, VAT on imports, excise duty on imports, and GDP was examined using Johansen's Co-integration test. The following is the model for the Trace Statistics that were used to determine the co-integration among variables:

$$\lambda_{Trace} \square -T \sum_{i \square r \square 1}^{n} \ln \square 1 - \lambda_i \square \quad \ldots\ldots (3)$$

Where: **T** stands for a number of sample size, $\lambda_{\mathbf{I}}$ is the i^{th} largest canonical correlations, $\lambda_{\mathbf{Trace}}$ **is** the set of the null, **r** co-integrating rank against the alternative of **n** co-integrating rank, **n** is the number of variables in which **r** = 0, 1, 2 since the number of variables used were 3 variables.

2.2.2.3. Vector error correction model specification

The Vector Error Correction Model (VECM) involves several steps, and it's a common approach for modelling the long-run and short-run dynamics among a set of cointegrated variables. The VECM is particularly useful when dealing with non-stationary time series that exhibit a stable, long-term relationship. In addition, it provides a mechanism to understand the long-run as well as short-run behaviour of the variable The Vector Error Correction Model used in this sudy is presented below:

$$\Delta \mathbf{lnGDP_t} = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \mathbf{lnGDP_{t-i}} + \sum_{j=1}^{k-1} \phi_j \Delta \text{lnCIT}_{t-j} + \sum_{m=1}^{k-1} \varphi_m \Delta \text{lnEXC}_{t-m} + \sum_{n=1}^{k-1} \psi_n \Delta \text{lnVAT}_{t-n} + \sum_{b=1}^{k-1} \varphi_b \Delta \text{lnEXR}_{t-b} + \sum_{h=1}^{k-1} \omega_h \Delta \text{lnIR}_{t-h} + \lambda_i \, \text{ECT}_{t-i} + \varepsilon_{it}$$

$$\Delta \mathbf{lnCIT_t} = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \text{lnGDP}_{t-i} + \sum_{j=1}^{k-1} \boldsymbol{\phi_j} \Delta \mathbf{lnCIT_{t-j}} + \sum_{m=1}^{k-1} \varphi_m \Delta \text{lnEXC}_{t-m} + \sum_{n=1}^{k-1} \psi_n \Delta \text{lnVAT}_{t-n} + \sum_{b=1}^{k-1} \varphi_b \Delta \text{lnEXR}_{t-b} + \sum_{h=1}^{k-1} \omega_h \Delta \text{lnIR}_{t-h} + \lambda_i \, \text{ECT}_{t-i} + \varepsilon_{it}$$

$$\Delta\mathbf{lnEXC_t} = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \ln GDP_{t-i} + \sum_{j=1}^{k-1} \phi_j \Delta \ln CIT_{t-j} + \sum_{m=1}^{k-1} \varphi_{\mathbf{m}} \Delta \mathbf{lnEXC_{t-m}} + \sum_{n=1}^{k-1} \psi_n \Delta \ln VAT_{t-n} + \sum_{b=1}^{k-1} \varphi_b \Delta \ln EXR_{t-b} + \sum_{h=1}^{k-1} \omega_{\boldsymbol{h}} \Delta \ln IR_{t-h} + \lambda_i \, ECT_{t-i} + \varepsilon_{it}$$

$$\Delta\mathbf{lnVAT_t} = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \ln GDP_{t-i} + \sum_{j=1}^{k-1} \phi_j \Delta \ln CIT_{t-j} + \sum_{m=1}^{k-1} \varphi_m \Delta \ln EXC_{t-m} + \sum_{n=1}^{k-1} \boldsymbol{\psi_n} \Delta \mathbf{lnVAT_{t-n}} + \sum_{b=1}^{k-1} \varphi_b \Delta \ln EXR_{t-b} + \sum_{h=1}^{k-1} \omega_{\boldsymbol{h}} \Delta \ln IR_{t-h} + \lambda_i \, ECT_{t-i} + \varepsilon_{it}$$

$$\Delta\mathbf{lnIR_t} = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \ln GDP_{t-i} + \sum_{j=1}^{k-1} \phi_j \Delta \ln CIT_{t-j} + \sum_{m=1}^{k-1} \varphi_m \Delta \ln EXC_{t-m} + \sum_{n=1}^{k-1} \psi_n \Delta \ln VAT_{t-n} + \sum_{b=1}^{k-1} \varphi_b \Delta \ln EXR_{t-b} + \sum_{h=1}^{k-1} m_{\boldsymbol{h}} \Delta \mathbf{lnIR_{t-h}} + \lambda_i \, ECT_{t-i} + \varepsilon_{it}$$

$$\Delta\mathbf{lnEXR_t} = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \ln GDP_{t-i} + \sum_{j=1}^{k-1} \phi_j \Delta \ln CIT_{t-j} + \sum_{m=1}^{k-1} \varphi_m \Delta \ln EXC_{t-m} + \sum_{n=1}^{k-1} \psi_{\mathbf{n}} \Delta \ln VAT_{t-n} + \sum_{b=1}^{k-1} \boldsymbol{\varphi_b} \Delta \mathbf{lnEXR_{t-b}} + \sum_{h=1}^{k-1} \omega_{\boldsymbol{h}} \Delta \ln IR_{t-h} + ECT_{t-i} + \varepsilon_{it}$$

Where:

k -1 = the lag length is reduced by 1.

α, β_j

, ϕ, φ, ω *and* ψ = Short-run dynamic coefficients of the model's adjustment long-run equilibrium.

λ_i = speed of adjustment of the parameter with a negative sign.

ECT_{t-i} = the error correction term is the lagged value of residuals obtained from the co-integration of the dependent variable on the regressors. Contain long-run information derived from long-run co-integrating relationships.

ΔLnGDP = change in economic growth value.

ΔLnCIT = Change in corporate income tax.

ΔLnEXC = Change in excise duty.

ΔLnVAT = Change in value added.

ΔLnIR= Change in inflation rate.

ΔLnEXR= Change in exchange rate.

ε_{it} = error term. Residuals (stochastic error terms often called impulses, innovations, or shocks)

2.2.2.4. Causality Test

It is a technique for determining whether a time series is useful in forecasting another (Farook and Kannan, 2016). In the Granger-sense, x is a cause of y if it is useful in forecasting y. In this framework, "useful" means that x is able to increase the accuracy of the prediction of y with respect to a forecast, considering only past values of y *(Granger, 1969).* There are three different types of situations in which a Granger-causality test can be applied. Firstly, in a simple Granger-causality test, there are two variables and their lags. Secondly, in a multivariate Granger-causality test more than two variables are included, because it is supposed that more

than one variable can influence the results. Finally, Granger-causality can also be tested in a VAR framework; in this case, the multivariate model is extended in order to test for the simultaneity of all included variables (Foresti, 2006). To test the null hypothesis that X does not Granger-cause Y, the test statistic is given by:

$$F = \frac{(RSS_R - RSS_{UR})/m}{(RSS_{UR})/(n-k)} \quad \ldots\ldots(4)$$

Where: RSS_R is restricted residual sum of squares, RSS_{UR} is the unrestricted residual sum of square, m is the number of lagged X terms, and K is the number of parameters estimated in the unrestricted regression. One pattern of causality distinguished: Unidirectional causality from economic growth to corporate income tax.

3. Results and Discussion

This section presents an empirical analysis of the study to examine the impact of corporate income tax on economic growth in Zanzibar from 1990 to 2021. The main sections presented are: Descriptive statistics, Unit root test, Lag selection, Vector Error Correction Model (VECM) results to determine the short run and the long run results, Stability diagnostic, Residual diagnostics, and Discussion of findings.

3.1. Summary Statistics

In this section, we report the descriptive statistics which provide some insight into the nature of the components of the relevant variables used in the study. The descriptive statistics include the mean, median, maximum, minimum, standard deviation, skewness, kurtosis, sum, sum squared deviation and number of observations. Measures of central tendency; the mean was used to summarise the data, while the standard deviation tested the degree of dispersion among the variables under investigation.

Table 2: Description of Descriptive Statistics for Variables of the Study

Statistics	GDP	CIT	EXC	VAT	EXR	IR
Mean	1573.22	8816.70	6851.58	854743,5	1219.43	11.21
Std. Dev.	832.06	12571.23	6908.77	911959.6	669.55	6.81
Medium	1398.05	2403.27	3639.19	483095.2	1163.04	10.01
Maximum	3275	42916.78	23751.36	3344799	2297.76	29.4
Minimum	555	345.6	389.6	10100	195.05	1.7
Skewness	0.582	1.55	1.17	1.08	0.27	0.93
Kurtosis	2.16	3.98	3.07	3.14	1.93	3.21
Observations	32	32	32	32	32	32

Source: Author's computation from Stata 17

From Table 2, we can observe that all the variables have positive average values (i.e., mean and median). This is normal considering the series involved. In addition, the series have minimal deviations from their means as shown by their standard deviations. The table shows that gross domestic product, corporate income tax, excise duty, value added tax, inflation rate and exchange rate recorded an average value of 1573.22, 8816.702, 6851.588, 854743.5, 1219.43, and 11.21 respectively. Corporate income tax, excise duty, value added tax and tax recorded a standard deviation which is higher than their respective mean and this shows that these variables recorded fast growth within the period under study. This is also seen in the wide margins between their respective. In terms of skewness, all of the variables are positively skewed, indicating that they are not symmetrically distributed. The Kurtosis values of the distributions indicated that they are not normally distributed.

3.2. Multicollinearity Test

Before further analysis, we conducted a multicollinearity test to examine linear collinearity exists between independent

variables in the study. The problem of multicollinearity arises when one explanatory variable in a multiple regression model highly correlates with one or more of the other explanatory variables. In the presence of multicollinearity, the solution of the regression model becomes unstable and leads to spurious results. Multicollinearity can be detected by computing a score called the variance inflation factor (or VIF), which measures how much the variance of a regression coefficient is inflated due to multicollinearity in the model. The smallest possible value of VIF is one (absence of multicollinearity). As a rule of thumb, a VIF value that exceeds 5 or 10 indicates a problematic amount of collinearity (James *et al.*, 2014). When faced to multicollinearity, the concerned variables should be removed, since the presence of multicollinearity implies that the information that this variable provides about the response is redundant in the presence of the other variables (James *et al.*, 2014, Bruce and Bruce, 2017).

From Table 3 below, the findings revealed the problem of multicollinearity. The independent variables LnCIT and LnVAT had the highest scores of 22.25 and 16.38 respectively which exceeded the mean VIF of 10.17

Table 3: Multicollinearity Test Results

Variable	VIF	1/VIF
LnCIT	22.25	0.045
LnVAT	16.38	0.00625
LnEXR	5.45	0.18
LnEXC	4.96	0.201
LnIR	1.82	0.549
Mean VIF	10.17	

Source: Author's compilation from STATA 17 output

In order to avoid the problem of multicollinearity as suggest by James *et al.* (2014), we decided to drop the independent variable LnVAT. From Table 4 after dropping LnVAT, the VIF has dropped to the normal range of less than 5 which indicates the problem of multicollinearity between independent variables is resolved.

Table 4: Multicollinearity Test Results

Variable	VIF	1/VIF
LnCIT	9.12	0.10
LnEXR	4.70	0.20
LnEXC	4.37	0.23
LnIR	1.67	0.59
Mean VIF	4.96	

Source: Author's compilation from STATA 17 output

3.3. Stationarity Test (Unit root test)

This section focuses on unit root tests for the stationarity of variables. The Augmented Dick Fuller test was used to test data stationarity. ADF was used to test the null hypothesis that the data are not stationary (has a unit root) against the alternative hypothesis that the data are stationary (has no unit root). A 5% level of significance was used and the guideline was to reject the null hypothesis if the ADF statistic is less than the critical level (0.05) (Priestley, 1969). Table 4 shows that at level form, all the variables are non-stationary tested with ADF. However, at first difference, all the variables become stationary.

Table 4: ADF Unit root tests

Variables	At Level			At First Difference		
	ADF statistic	5% Critical value	Prob	ADF statistic	5% Critical value	Prob
LnGDP	-1.984	-3.588	0.060	-4.098	-3.592	0.001
LnCIT	-2.812	-3.588	0.010			
LnEXC	-7.514	-3.588	0.000			
LnIR	-1.914	-3.580	0.067	-5.020	-3.584	0.000
LnEXR	-3.482	-3.584	0.002			

*Indicates level of significance is at 5%: Source: Author's computation from STATA 17 output

3.4. Selection Criteria for the model

In determining the number of lags to be used in the model, the optimal lag is selected using the Vector Autoregressive (VAR) lag order selection criteria. The lag chosen is the one with stars, where the Akaike Information Criteria (AIC) has the lowest value among other criteria. The AIC is superior to the Likelihood Ratio test (LR), Final in the case of a small sample of sixty (60) observations and below, in the sense that they minimize the chance of under-estimation while maximizing the chance of recovering the true lag length (Liew, Which lag length selection criteria should we employ, 2004)

Table 5: Lag order Selection Criteria Results

Lag	LogL	LR	Df	FPE	AIC	HQIC	SBIC
0	-0.9960			6.6e-08	0.499721	0.586993	0.785193
1	152.111	306.21	36	1.7e-11	-7.86506	-7.25416	-5.86675
2	223.33	142.44	36	2.0e-12	-10.3807	-9.24621	-6.6696
3	302.171	157.68	36	3.5e-13	-13.4408	-11.7827	-8.01685
4	1899.16	3194*	36	1.5e-59*	-124.94*	-122.759*	-117.804*

*Indicates lag order selected by the criterion

The results from Table 5 above, depict the Vector Autoregressive (VAR) Lag order selection criteria. Since the Likelihood Ratio test (RL) and AIC were optimal at lag 4, the study employed lag 4. As tabulated in the summary of VAR selection criteria, lag 4 was employed for the Johansen co-integration test and VECM estimation**.**

3.5. Co-integration Test

Johansen co-integration uses two statistics for testing the hypothesis, namely trace statistics and maximum statistics. The guideline for testing co-integration is that when the trace statistics are greater than the 5 percent critical value, then reject the null hypothesis; otherwise, do not reject the null hypothesis (Saikkonen and Lütkepohl, 2000). Also, when the maximum Eigen statistics are greater than the 5 percent critical value then reject the null hypothesis; otherwise; fail to reject the null hypothesis. Consider the following hypothesis of maximum rank:

Maximum rank zero

H_{0d}: There is no co-integration among variables

H_{1d}: There is a cointegration among variables

If Trace statistics or Maximum-Eigen statistics are less than 5% Critical value then accept or do not reject H_0.

Table 6: Johansen tests for co-integration results (Trace Statistics and Maximum Eigen Value)

Maximum rank	Parms	LL	Eigenvalue	Trace statistics	5% critical value
0	114	59.55002	-	263.1147	94.15
1	135	93.593325	211.325	190.0799	68.52
2	134	111.3255	124.004	126.9933	47.21
3	141	121.46198	72.0183	58.9067	29.68
4	146	123.04665	25.1032	23.4423	15.41
5	149		3.0510	5.1194*	3.76
6	150				

*Indicates ranks of co-integration equation at 5%: Source: Author's compilation from STATA 17 output.

From the Johansen co-integration test results in Table 6 above, the trace statistics indicate that there is a maximum of three co-integration equations in this model. For maximum rank zero, the null hypothesis is rejected since the trace statistics (126.9933) are greater than the critical value (47.21) at the 5 percent level. Implying that the variables of the study are cointegrating. For one co-integrating equation, the trace statistics (58.9067) is greater than the 5 percent critical value (29.68), therefore the null hypothesis is rejected. For two co-integrating equations, the trace statistics (23.4423) is greater than the 5 percent critical value (15.41), therefore the null hypothesis is rejected. For three co-integrating equations, the trace statistics (3.1694) is less than 5 percent critical value (3.76), therefore the null hypothesis is rejected. Therefore, the fact that there is cointegration among the variables under study confirms the presence of a long-run causal relationship among the variables. Therefore, it gives room to determine the short-run and long-run effects by using VECM.

3.5.1. Short Run Effect

The results in Table 7 below show the short-run effect of corporate income tax, excise duty and value added tax on economic growth value. And also, the speed of the adjustment parameter towards the long-run equilibrium.

Table 7: Result of short-run effect Vector error correction model

Variables	Coef.	Std. Err.	Z	Prob	[95% Conf. Interval]	
$\mathbf{ECT_{t-1}}$	-0.335	0.087	-0.35	0.006	-0.210	-0.035
$\mathbf{\Delta LnGDP_{t-1}}$	-0.060	0.151	-0.40	0.689	-0.355	0.235
ΔLnCIT	0.106	0.058	1.82	0.069	-1.674	0.485
ΔLnEXC	-0.003	0.026	-0.01	0.000	-1.013	0.405
ΔLnIR	-1.467	25.53	-0.06	0.954	-51.49	48.56
ΔLnEXR	-3.655	2.353	-1.55	0.120	-8.266	0.956
Constant	-0.005	0.034	-0.13	0.896	-0.070	0.061

*Indicates level of significance is at 5%: Source: Author's computation from STATA 17 output

The results from Table 7 above revealed that in the short run, economic growth and corporate income tax were statistically insignificant at a 5% level of significance. This implies that the impact of corporate income tax on economic growth was statistically insignificant in the short run.

3.5.2. The long-run effects

From the Johansen cointegration test, the trace statistic reveals that there is one cointegrating equation. The presence of a cointegrating equation indicates the existence of a long-run positive effect between corporate income tax and economic growth inflow in Zanzibar

Table 8: Johansen normalization restriction imposed

Variables	Coef.	Std. Err.	Z	Prob	[95% Conf. Interval]	
$LnGDP_{t-1}$	1					
LnCIT	0.05298	0.110565	-0.48	0.000	-0.269689	0.1637175
LnEXC	0.048196	0.085072	0.57	0.000	-0.118542	0.2149342
$LnIR_{t-1}$	0.03886	0.2421133	0.16	0.872	-0.435673	0.5133937
LnEXR	-0.08560	0.1288489	-0.66	0.006	-0.338146	0.1669318
Constant	-0.35907					

*Indicates level of significance is at 5%: Source: Author's computation from STATA 17 output

Table 8 above revealed that in the long run, all variables corporate income tax, excise duty, and value-added tax are statistically significant at a 5 percent level of significance since their P-value is less than 0.05. Also, value-added tax and corporate income tax positively impact economic growth value. While excise duty has a negative impact on economic growth value.

From Table 8 above, the estimated cointegrating equation and long-run model is

$$ECT_{t-1} = [1.000LnGDP_{t-1} + 0.05298LnCIT + 0.524515LnEXC + 0.07714LnVAT_{t-1} + 0.03886LnIR_{t-1} - 0.08560LnEXR - 0.35907]$$

3.6. Causal Relationship between Corporate income tax and Economic growth in Zanzibar

Granger causality determines the causal relationship between the dependent and independent variables. This was carried out to establish if the corporate income tax causes economic growth on the one hand and to also know if the economic growth can cause the corporate income tax. In order to determine causality, if the ranked p-value is greater than the 5 percent confidence level, the null hypothesis is accepted and, conversely, if the ranked p-value is less than the 5 percent confidence level, the null hypothesis is rejected and a causal relationship is concluded.

Table 9: Pairwise Granger causality test

Null Hypothesis:	Obs	F-Statistic	Prob.
D_LnGDP does not Granger Cause LnCIT	30	-1.02	0.374
LnCIT does not Granger Cause D_LnGDP		-0.15	0.0624
LnEXC does not Granger Cause LnCIT	30	57.544	0.0000
LnCIT does not Granger Cause LnEXC		1.1882	0.3254
LnCIT does not Granger Cause D_LnVAT		4.2097	0.0298
D_LnIR does not Granger Cause LnEXR		0.22	0.830
LnEXR does not Granger Cause D_LnIR		1.99	0.059

Source: Computed by the Author
Note: D_means difference and Stationarity.

The results from Table 9 above show that the lagged value of economic growth causes corporate income tax as the p-value is less than 0.05. However, because of the p-value (0.374>0.05), the lagged value of corporate income tax does not cause economic growth. Therefore, the null cannot be rejected; the direction of causality is from economic growth to corporate income tax during 1990 to 2021.

3.7. Discussion of Key Findings

3.7.1. Discussion of the Long-Run and Short-Run Effects of the Corporate Income Tax on Economic Growth

The findings of the study show a significant positive effect of corporate income tax on economic growth value in the long run; the p-value is less than the 5 percent level of significance; therefore, there was enough evidence not to reject the null hypothesis that

there is an insignificant effect of corporate income tax on the economic growth value of Zanzibar. The estimated coefficient of corporate income tax, in the long run, implied that a unit increase in corporate income tax results in a positive effect on economic growth value by 0.90

This empirical finding supports previous studies in advanced economies that found a positive relationship between corporate income tax and economic growth (e.g., Gecher and Heimberger, 2022). Moreover, more supporting evidence can be found in emerging economies and developing economies, including Onakoya and Afintinni (2016) who found that a long-run relationship existed between taxation and economic growth in Nigeria. The result also revealed a significant positive relationship at a 5 percent level of significance between petroleum profit tax, company income tax, and economic growth, but a negative relationship between economic growth and customs and excise duties. In addition, Odhiambo and Olushola (2018) examined taxation and economic growth in a resource-rich country like Nigeria and found similar results. On the other hand, Kadenge (2021) and Chirinko and Wilson, (2017) found that there is a negative relationship between corporate income tax and economic performance which indicates that the increase in corporate income tax on businesses may be harmful to the economy in the long run. These findings confirm how massive corporate tax cuts affect the economic growth. On other hand, regarding the short run effects of corporate income tax on economic growth. The findings revealed no short-run impact of corporate income tax on economic growth in Zanzibar from 1990 to 2021. The findings are in line with those of Dladla and Khobai (2018) who found that corporate income had no significant impact on economic growth in the short run.

3.7.2. Discussion on Causal Relationship between Corporate Income Tax and Economic Growth in Zanzibar.

The above findings from Table 9 revealed that the direction of causality is from economic growth to corporate income tax in Zanzibar. This implies that there is unidirectional causation from economic growth to corporate income tax from 1990 to 2021. Therefore, the value of economic growth can be used to predict the future value of corporate tax in Zanzibar in the short run as well as in the long run, while corporate tax can't be used to predict the economic growth movement.

The particular findings appear to impact corporate income tax, suggesting that economic expansion may contribute to increased tax revenue in Zanzibar. This is evidently due to strong economic performance and suitable government policies, such as Zanzibar Blue Economic Policies which are in alignment with Zanzibar Development Vision 2050. The policies attract foreign investors, result in higher corporate profits and increased tax collections. However, the existing corporate tax policies require extensive review and some adjustments to ensure the incidence of the corporate income tax does not fall on people. It should also be noted that the corporate income tax raises the cost of capital and reduces after-tax returns in the corporate sector, and thus leads to a migration of capital into non-corporate or tax-exempt sectors of the economy. The findings corroborated Kimani (2021), Onakoya and Afintinni (2016), Baranová and Jancková's (2012) findings that corporate taxes had unidirectional causation from economic growth to corporate income tax. Meanwhile, Agunbiade and Idebi (2020) found a bidirectional granger causality exists between GDP and CIT in Nigeria. On contrary, Dzingirai Canicio, (2014) found no causal relationship at all between government tax revenue and economic growth in Zimbabwe.

4. Conclusions and Recommendation of the study

The study intended to examine the impact of corporate income tax on economic growth in Zanzibar from 1990 to 2021. The study used time series data on economic growth value, corporate income tax, value-added tax, excise duty variables and control variables such as inflation rate and exchange rate. The results

showed that corporate income tax has an impact on economic growth only in the long run. The Granger causality test revealed the existence of significant unidirectional causality between corporate income tax and economic growth value. Due to these findings, it can be concluded that the corporate income tax provides a broader tax base enabling tax authorities to collect more taxes. The study recommends that policymakers should consider reducing these rates since lower tax rates can encourage investment, promote entrepreneurship, and stimulate economic activity. Potentially leading to high economic growth in the long run. Policymakers may also consider a tax base by reducing certain tax exemptions and deductions. Moreover, complex and some excessive tax regulations can create compliance costs and discourage investment. Simplifying tax regulations and procedures can make the system more transparent, predictable, and efficient, which may positively affect economic growth. Also, the government should engage in a complete re-organization of the tax administrative machinery to reduce tolerable problems of tax evasion and avoidance. Finally, the culture of good governance should be embraced by the government to secure the loyalty of the populace to a good tax culture. This research paper suggests further studies to examine other variables that affect economic growth such as payees, import duty, and other taxes.

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